AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An apparatus comprising:

a needle having dimensions suitable for insertion into a body, a distal portion suitable for insertion into tissue, a distal opening, and a lumen extending from a proximal end to the distal opening and in communication with the distal opening to allow a substance to be delivered through the lumen and out of the opening;

a thermally conductive heating element coupled to the distal portion of the needle, the heating element comprising material whose electrical resistance changes in response to a change in temperature; and

an interface to a balanced circuit having the heating element and a variable resistor as resistive circuit elements, wherein the balanced circuit measures a first differential resistance between the heating element and the variable resistor in response to a first condition and a second differential resistance in response to a second condition in circuitry to indicate a change of conditions related to a distance of penetration of the thermally conductive heating element into a tissue from a fluid boundary with the tissue, wherein the first condition comprises the distal portion of the needle penetrating a vessel wall first location and disposed in fluid, and the second condition comprises the distal portion of the needle extending through the fluid and disposed within tissue of a vessel wall second location.

2. (Canceled)

3. (Previously Presented) The apparatus of Claim 1, wherein the needle has an outer diameter between 0.009 inches and 0.134 inches.

4. (Previously Presented) The apparatus of Claim 1, wherein the needle comprises a material of at least one of stainless steel and ceramic.

5. (Previously Presented) The apparatus of Claim 1, wherein the needle is a rod.

6. (Original) The apparatus of Claim 1, wherein the heating element comprises at least one of a wire, a film, and a thermistor material.

7. (Previously Presented) The apparatus of Claim 1, wherein the heating element has a length which is approximately equal to or less than the thickness of a tissue in to which at least a portion of the needle is to be inserted.

8. (Original) The apparatus of Claim 7, wherein the length of the heating element is between 0.010 inches and 0.400 inches.

9. (Previously Presented) The apparatus of Claim 1, wherein the interface is an anemometry circuitry interface comprising:

a first electrically conductive lead electrically coupled to a first end of the heating element; and

a second electrically conductive lead electrically coupled to a second end of the heating element.

10. (Previously Presented) The apparatus of Claim 1, wherein a portion of the needle comprises an electrically conductive material and wherein the interface comprises:

an electrically conductive lead electrically coupled to a first end of the heating element, and

the needle electrically coupled to a second end of the heating element.

11. (Currently Amended) An apparatus comprising:

a needle having dimensions suitable for insertion into a body, and having a distal end capable of puncturing skin;

a thermally conductive heating element coupled to a portion of the needle adjacent to the distal end, the heating element comprising material whose electrical resistance changes in response to a change in temperature; and

an interface to electrically couple an anemometry circuitry to the heating element, wherein the circuitry comprises a balanced circuit having the heating element and a variable resistor as resistive circuit elements to measure a first differential resistance between the heating element and the variable resistor in response to a first condition and a second differential resistance in response to a second condition, wherein the first condition comprises the distal end of the needle disposed in fluid, and the second condition comprises the distal portion of the needle disposed in the fluid and the distal end disposed within tissue.

12. (Previously Presented) The apparatus of Claim 11, wherein the needle has an outer diameter between 0.009 inches and 0.134 inches, and wherein the distal end is sharpened.

13. (Original) The apparatus of Claim 11, wherein the needle comprises a material of at least one of stainless steel and ceramic.

14. (Previously Presented) The apparatus of Claim 11, further comprising anemometry circuitry electrically coupled to the heating element wherein the circuitry comprises a balanced circuit having a heating element and a variable resistor as resistive circuit elements, wherein the heating element comprises at least one of a wire, a film, and a thermistor material.

15. (Previously Presented) The apparatus of Claim 11, wherein the heating element has a length which is approximately equal to or less than the thickness of a tissue in to which at least a portion of the needle is to be inserted.

16. (Original) The apparatus of Claim 15, wherein the length of the heating element is between 0.010 inches and 0.400 inches.

17. (Previously Presented) The apparatus of Claim 14, wherein the anemometry circuitry is electrically coupled to a first end of the heating element by a first electrically conductive lead and is electrically coupled to a second end of the heating element by a second electrically conductive lead.

18. (Previously Presented) The apparatus of Claim 14, wherein a portion of the needle comprises an electrically conductive material and wherein the anemometry circuitry is electrically coupled to a first end of the heating element by an electrically conductive lead and is electrically coupled to a second end of the heating element by the needle.

19. (Previously Presented) The apparatus of Claim 14, wherein the anemometry circuitry comprises:

a circuit having the heating element and a variable resistor as resistive circuit elements; and

an amplifier electrically coupled to the circuit

to sense the difference in voltage drop across the heating element and the variable resistor caused by the difference between a first resistance of the heating element and a resistance of the variable resistor,

to amplify the voltage difference, and

to input the amplified voltage difference back to the circuit to cause a modification of a temperature of the heating element such that the heating element assumes a second resistance.

20. (Previously Presented) The apparatus of Claim 14, further comprising a plurality of heating elements wherein the heating element and the plurality of heating elements are coupled along a length of the needle, and further comprising:

anemometry circuitry separately coupled to each of selected heating elements of both the heating element and the plurality of heating elements such that the heat dissipation characteristics measured by the plurality of anemometry circuits can be used to determine at least one of injection depth and tissue type.

21-25. (Canceled.)

26. (Previously Presented) The apparatus of Claim 11 wherein the needle has dimensions suitable for insertion into a tissue of the body and the balanced circuit is configured to measure a distance of penetration of the thermally conductive heating element into the tissue.

27. (Currently Amended) The apparatus of Claim 1 wherein the thermally conductive heating element is located distal to the distal opening~~, the first condition comprises the distal portion of the needle penetrating a vessel wall first location and disposed in fluid, and the second condition comprises the distal portion of the needle extending through the fluid and disposed within tissue of a vessel wall second location~~.

28. (Currently Amended) The apparatus of Claim 11 wherein the thermally conductive heating element is located distal to the distal opening~~, the first condition comprises the distal end of the needle disposed in fluid, and the second condition comprises the distal portion of the needle disposed in the fluid and the distal end disposed within tissue~~.

29. (Previously Presented) The apparatus of Claim 1, further comprising a plurality of heating elements wherein the heating elements and the additional heating element are coupled along a length of the needle, and further comprising:

anemometry circuitry separately coupled to each of selected heating elements of both the heating element and the plurality of heating elements such that the heat dissipation characteristics measured by the plurality of anemometry circuits can be used to determine at least one of injection depth and tissue type.

30. (Previously Presented) The apparatus of Claim 1, further comprising anemometry circuitry electrically coupled to the heating element wherein the anemometry circuitry comprises a balanced circuit having a heating element and a variable resistor as resistive circuit elements, wherein the heating element comprises at least one of a wire, a film, and a thermistor material; and

wherein the anemometry circuitry comprises:

a circuit having the heating element and a variable resistor as resistive circuit elements; and

an amplifier electrically coupled to the circuit

to sense the difference in voltage drop across the heating element and the variable resistor caused by the difference between a first resistance of the heating element and a resistance of the variable resistor,

to amplify the voltage difference, and

to input the amplified voltage difference back to the circuit to cause a modification of a temperature of the heating element such that the heating element assumes a second resistance.

31. (Previously Presented) The apparatus of claim 1, wherein the distance of penetration is a distance through an inner surface of a vessel, from inside the vessel.

32. (Previously Presented) The apparatus of claim 27, wherein the fluid is blood filling the vessel, and the second condition comprises a portion of the needle proximal to the heating

element disposed within the fluid, and a distal end of the distal portion of the needle disposed within the tissue.

33. (New) An apparatus comprising:

a needle having dimensions suitable for insertion into a body, and having a distal end capable of puncturing skin;

a thermally conductive heating element coupled to a portion of the needle adjacent to the distal end, the heating element comprising material whose electrical resistance changes in response to a change in temperature; and

an interface electrically coupling an anemometry circuitry to the heating element, wherein the circuitry comprises a balanced circuit having the heating element and a variable resistor as resistive circuit elements, and wherein the anemometry circuitry comprises an amplifier electrically coupled to the circuit to sense the difference in voltage drop across the heating element and the variable resistor caused by the difference between a first resistance of the heating element and a resistance of the variable resistor.